REMARKS

Claims 1-26 are currently pending and stand rejected. Claims 1, 2, 6, 10, and 15-17 have been amended. Claim 18 has been cancelled. Reconsideration of the above-identified application in view of the present amendment and remarks is respectfully requested.

I.   Objection to the Specification

The abstract and one paragraph of the specification have been objected to for various informalities. The specification has been amended in accordance with the Examiner's suggestions. It is thus respectfully requested that the objection be withdrawn.

II.   Objection to Clams 2, 6, 10, 15, 17, and 18

Claims 2, 6, 10, 15, 17, and 18 have been objected to for various informalities. Each of claims 2, 6, 10, 15, and 17 has been amended in accordance with the Examiner's suggestions. Claim 18 has been cancelled. It is thus respectfully requested that the objection be withdrawn.

III.   Rejection of Claims 1, 2, 4-7, and 10-14 Under 35 U.S.C. §103(a)

Claims 1, 2, 4-7, and 10-14 have been rejected as unpatentable over U.S. Patent No. 6,801,662 to Owechko et al. (hereinafter: "Owechko") in view of the article "Quad-Tree Segmentation for Texture-Based Image Query" by Smith et al. (hereinafter "Smith"). It is respectfully submitted that claims 1, 2, 4-7, and 10-14 define patentable invention over Owechko and Smith, whether taken singularly or in combination.

Claim 1 recites a system for classifying an input image into one of a plurality of output classes. The system includes a plurality of pattern recognition classifiers. Each pattern recognition classifier is operative to process feature data associated with the input image to determine an associated output class of the input image. The system further includes a plurality of feature extractors. Each feature extractor applies a fixed grid pattern associated with its associated pattern recognition classifier to the input image, where the applied grid pattern is constant at each feature extractor and differs among the plurality of feature extractors, to extract feature data from the input image for an associated one of the plurality of pattern recognition classifiers.

It is respectfully submitted that Owechko and Smith, taken alone or in combination, fail to teach or suggest a plurality of feature extractors that each apply a fixed grid pattern associated with its associated pattern recognition classifier to the input image, with the fixed grid patterns differing among the plurality of feature extractors. As the Examiner points out in the Office Action of April 9, 2007, at page 5, Owechko does not teach extracting feature data according to a grid model, and Smith is relied upon to provide this teaching. It is respectfully submitted, however, that Smith teaches a dynamic segmentation system, where each input pattern is segmented into a grid pattern based upon its texture content as to identify homogenous regions of textures. The regions of identified texture can then be evaluated, and the pattern is indexed according to the identified texture. Essentially, Smith appears to suggest the use of quad-tree segmentation for characterizing the texture of input samples, but there is clearly no teaching or suggestion of generating

a single fixed grid pattern to represent a given classifier, such that the grid

concentrates feature extraction on regions important to that classifier. Nothing in

Owechko would lead one skilled in the art to modify Smith to produce the claimed

invention. It is thus respectfully submitted that one skilled in the art, absent the

teachings of the subject application, would not be lead to utilize a fixed grid pattern

for feature extraction from the teachings of Smith and Owechko.

It is respectfully further submitted that one skilled in the art would not seek to

incorporate the quad-tree segmentation of Smith into the feature extractors of

Owechko, as the feature extractors (110, 120, 130, and 140) taught in Owechko are

poorly suited to use with the quad-tree segmentation of Smith. For example, the

range map module 110 of Owechko produces a single range value for a human head

using two sensors to make a depth measurement. It is respectfully submitted that

the process of generating the depth value would not be enhanced through

application of the quad-tree segmentation of Smith, and the quad-tree segmentation

cannot be applied to the generated depth value to extract features. The occupant

change detection module 120 monitors one region of a document for drastic changes

in the image. Owechko generates second order statistics for a preselected region of

the image over a series of frames to produce a rolling average. Incorporating the

quad-tree segmentation of Smith in the occupant change detection would require

significant additional computational expense for no discernable gain in accuracy. In

fact, relying on the dynamic grid methodology of Smith would likely decrease the

accuracy of the module 120 by making the module more sensitive to changes in the

occupant position. Since each pattern is subjected to a different segmentation in

Smith, there is no correlation in the size or position of regions from which feature values are drawn between successive samples, making it more likely that small movements by the occupant would be exaggerated.

A motion detection module 130 compares sequences of images to determine where motion has taken place within a vehicle. The comparison between the images would not be enhanced by the use of the dynamic quad-tree segmentation described in Smith, and the motion pixels and motion map would not be amenable to analysis via the quad-tree segmentation, as the dynamic quad-tree segmentation of Smith effectively destroys location information necessary for occupant out-of-position (OOP) determinations due to the lack of correlation of region size and location between samples. By the same reasoning, the edge detection and density map 140 would not be amenable to the dynamic grid segmentation of Smith, as the edge density analysis is similarly dependant on the location of the regions of high edge density. To create the claimed system from Smith and Owechko, it would be necessary to redesign one or both of the sensor fusion arrangement of Owechko, such that location invariant features could be utilized or the dynamic indexing scheme of Smith. It is respectfully submitted that either change would represent a fundamental change in the principle of operation of the altered reference, and thus the proposed combination of Owechko and Smith does not state a prima facie case of obviousness. See In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). It is thus respectfully submitted that claim 1 defines patentable invention over the cited art, and the withdrawal of the rejection of claim 1 is respectfully requested.

Claim 11 recites similar subject matter to claim 1, as it also recites a single

classifier grid model associated with a classifier that is used to extract features for

that classifier. It is thus respectfully submitted the claim 11 is allowable over the

cited art. Claims 2, 4-7, 10, and 12-14 each depend, directly or indirectly from

claims 1 and 11, and are allowable for at least the reasons given for claims 1 and 11.

It is thus respectfully requested that the rejection of claims 1, 2, 4-7, and 10-14 be

withdrawn.

IV.   Rejection of Claims 16-22 and 24-26 Under 35 U.S.C. §103(a)

Claims 16-22 and 24-26 have been rejected as unpatentable over U.S. Patent

No. 6,801,662 to Owechko et al. (hereinafter: "Owechko") in view of the article

"Quad-Tree Segmentation for Texture-Based Image Query" by Smith et al.

(hereinafter "Smith"). It is respectfully submitted that claims 16-22 and 24-26 define

patentable invention over Owechko and Smith.

Claim 16 recites a method for classifying image data into one of a plurality of

output classes. A classifier grid model associated with a pattern recognition

classifier is established from a composite image formed from a plurality of training

samples belonging to at least one output class represented by the pattern

recognition classifier. An unknown object is imaged to create an input image. The

classifier grid model is placed over the input image to produce a plurality of sub-

images. Feature data is extracted from the plurality of sub-images. The unknown

object is classified from the extracted feature data.

It is respectfully submitted that Owechko and Smith fail to teach or suggest

establishing a classifier grid model from a composite image formed from a plurality of

training samples belonging to at least one output class represented by the pattern

recognition classifier. The Office Action cites a portion of Smith as providing this

teaching, but it is respectfully submitted that the cited portion of Smith discusses the

establishment of a test database for the system comprising a number of composite

images. These images are not used to form any sort of grid model that is applied to

an input pattern to produce sub-images, as recited in the claim, but rather become

entries in the database for comparison to future queries. See Owechko, §6.2 ("This

produced images each with five possibly distinct textures contained in possibly many

disjoint regions. 'Queries-by-texture' were then performed on this composite image

database using cuts from the Brodatz textures as texture keys.). To the extent they

can be read on the claimed system, they represent output classes, not an

established grid model. Owechko does not remedy this deficiency. It is thus

respectfully submitted one skilled in the art, presented with the teachings of Smith

and Owechko, would not be lead to create the claimed methodology, and it is

respectfully submitted that claim 16 defines patentable invention over the cited art.

Each of claims 17-22 and 24-26 depend, directly or indirectly, from claim 16,

and are allowed for at least the reasons given in the discussion of claim 16. It is thus

submitted that claims 16-22 and 24-26 define patentable invention over the cited art,

and the withdrawal of the rejection of these claims is respectfully requested.

V.   Rejection of Claims 3 and 8 Under 35 U.S.C. §103(a)

Claims 3 and 8 have been rejected as unpatentable over Owechko and Smith

in further view of U.S. Patent Publication No. 2004/0153229 (hereinafter: Gokturk).

Goktruk does not remedy the deficiencies of Owechko and Smith as applied to

claim 1 as described previously. Claims 3 and 8 each depend from claim 1 and are allowable for at least the same reasons. It is thus respectfully submitted claims 3 and 8 defines patentable invention over the cited art and the withdrawal of the rejection of claims 3-8 is requested.

VI. Rejection of Claim 9 Under 35 U.S.C. §103(a)

Claim 9 has been rejected as unpatentable over Owechko, Smith, and Gokturk in further view of the article "MAHEM: A Multiprocessor Engine for Fast Contrast-Limited Adaptive Histogram Equalization," by Ericksen et al. (hereinafter: Ericksen). Ericksen does not remedy the deficiencies of Owechko and Smith as applied to claim 1 as described previously. Claim 9 depends from claim 1 through claim 8, and is allowable for at least the same reasons as claims 1 and 8. It is thus respectfully submitted claim 9 defines patentable invention over the cited art and the withdrawal of the rejection of claim 9 is requested.

VII. Rejection of Claim 15 Under 35 U.S.C. §103(a)

Claim 15 has been rejected as unpatentable over Owechko and Smith in further view of U.S. Patent No. 5,983,147 to Krumm (hereinafter: Krumm). Krumm does not remedy the deficiencies of Owechko and Smith as applied to claim 11 as described previously. Claim 15 depends from claim 11 and is allowable for at least the same reasons. It is thus respectfully submitted claim 15 defines patentable invention over the cited art and the withdrawal of the rejection of claim 15 is requested.
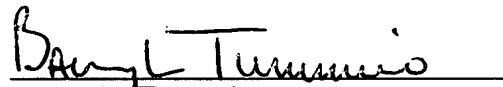
VIII. Rejection of Claim 23 Under 35 U.S.C. §103(a)

Claim 23 has been rejected as unpatentable over Owechko and Smith in further view of the article "Texture Segmentation using Multiscale Hurst Features," by Kaplan et al. (hereinafter: Kaplan). Kaplan does not remedy the deficiencies of Owechko and Smith as applied to claim 16 described previously. Claim 23 depends from claim 16 through claim 22, and is allowable for at least the same reasons as claims 1 and 22. It is thus respectfully submitted claim 23 defines patentable invention over the cited art and the withdrawal of the rejection of claim 23 is requested.

Please charge any deficiency or credit any overpayment in the fees for this matter to our Deposit Account No. 20-0090.

Respectfully submitted,

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